

# A study on the genus *Herochroma* Swinhoe in China, with descriptions of four new species (Lepidoptera: Geometridae, Geometrinae)

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**Abstract:** Four new species of the genus *Herochroma* are described: *H. curvata* sp. nov. from Hainan and Guangxi, *H. pal-lensia* sp. nov. from Guangxi, Hunan and Fujian, *H. perspicillata* sp. nov. from Yunnan, and *H. rosulata* sp. nov. from Hainan. The male of *H. mansfieldi* (Prout) is recorded and described for the first time. Illustrations of moths and genitalia of new species and a key to all species from China are provided. *H. yazakii* Inoue is firstly recorded to the fauna of China.

**Key words:** Lepidoptera; Geometridae; *Herochroma*; new species; China

The genus *Herochroma* was erected by Swinhoe (1893), and is restricted to the Oriental Region. Prout (1912, 1932) defined *Herochroma* Swinhoe and erected two new genera, *Archaeobalbis* and *Neobalbis*. Hol-loway (1996) redefined *Herochroma* by uniting *Archae-obalbis* and *Neobalbis*. Inoue (1999) made a compre-hensive revision of the whole genus, with descriptions of four new species, *H. yazakii* (N. E. India, Ne-pal), *H. supraviridaria* (Taiwan, China), *H. pseudocristata* (Philippines) and *H. aeruginosa* (Philippines). Inoue divided the species of the genus into two groups (*baba*-group and *flavibasalis*-group) based on genitalia and discal spot on underside of hindwing. We have used these characters in designing the key to Chinese species.

Based on the collection in the IZCAS, in this pa-per all the known species of the genus from China are included, and four new species (three species of the *baba*-group, and one of the *flavibasalis*-group of Inoue) are described with illustrations of moths and geni-talia. A key to all Chinese species is given. *H. mans-fieldi* (Prout) from Yunnan has been known from the fe-male holotype only, in this paper the male is recorded

and described for the first time based on a specimen from Hubei. *H. yazakii* Inoue is firstly recorded in the fauna of China. Up to now, thirty species of the genus have been described worldwide, of which 13 have been recorded in China. All specimens including the type specimens of new species are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), except for specimens in the ZFMK (Zoologisches Forschungsinsitut und Museum A. Koe-nig). Terminology follows Nichols (1989). Following abbreviations are used for specimen depositories:

BMNH: The Natural History Museum, London, United Kingdom;

HUS: Entomological Institute, Kokkaido Universi-ty, Sapporo, Japan;

IZCAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, China;

MNHN: Museum National d'Histoire Naturelle, Paris, France;

ZFMK: Zoologisches Forschungsinstitut und Mu-seum Alexander Koenig, Bonn, Germany;

ZSM: Zoologische Staatssmlungen, München, Germany.

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## *Herochroma* Swinhoe, 1893

*Herochroma* Swinhoe, 1893, *Ann. Mag. nat. Hist.*, (6) 12:

148. Type species: *Herochroma baba* Swinhoe, 1893, *ibidem* (6) 12: 148, by monotypy. [INDIA]: Khasia Hills.

*Archaeobalbis* Prout, 1912, in Wytzman, *Genera Insect.*, 129: 9 (key), 24. Type species: *Hypochroma viridaria* Moore, 1868, *Proc. Zool. Soc. Lond.*, 1867: 632, by original designation. [INDIA]: Bengal.

*Neobalbis* Prout, 1912, in Wytzman, *Genera Insect.*, 129: 10 (key), 26. Type species: *Pseudoterpna elaearia* Hampson, 1903, *J. Bombay nat. Hist. Soc.*, 14: 654, by original designation. SIKKIM [INDIA]: Khasia Hills (Khasis).

*Chloroclydon* Warren, 1894, *Novit. zool.*, 1: 464. Type species: *Scotopteryx usneata* Felder & Rogenhofer, 1875, *Reise öst. Fregatte Novara (Zool.)*, 2 (Abt. 2): pl. 125, fig. 12, by original designation. [INDIA]: [Himachal Pradesh], Himalaya, Chini.

Antennae in both sexes simple. Frons protuberant. Palpus moderate, second joint densely rough scaled, third joint in ♀ elongate. Pectus, underside of abdomen base and femora densely hairy. Most species with male hindtibia dilated, with tuft of hairs, terminal process, and two pairs of spurs. Vein  $R_1$  from cell, anastomosing at a point or connected with Sc,  $R_2$  from cell or the stalk of  $R_3$ - $R_5$ , anastomosing at a point with  $R_1$ .

Wings speckled with green on a straw-coloured ground. Most species with irregular brown markings outside green postmedian line. Species of *baba*-group with the anal angle of hindwing somewhat produced in male, and underside with discal spots dot-like. Species of *flavibasalis*-group with the anal angle of hindwing rounded, underside of hindwing lacking discal spots, some species with very thin dash-like discal spots.

**Male genitalia** Socii strong, rather club-like, laterally directed; uncus simple, bilobed or vestigial; transtilla well developed, with differently shaped processes; valves large, complex, partially divided. Aedeagus generally slender, with coecum penis long, manica with strongly sclerotized process, without cornutus. Male abdomen with a pair of setal patches on 3rd sternite, sometimes the two setal patches expanded and

joined together.

**Female genitalia** Ductus bursae sclerotized. Many species with developed lamella antevaginalis and corpus bursae with signum.

**Distribution** China, Turkistan, Tajikistan, Kashmir, Pakistan, India, Burma, Thailand, Vietnam, Philippines, Malaysia, Indonesia.

### Key to the Chinese species of *Herochroma* Swinhoe

1. Discal spots on hindwing underside slender bar-like ..... 2  
Discal spots on hindwing underside dot-like ..... 3
2. Length of forewing in male 22 – 25 mm; male genitalia with costal process as long as sacculus process ..... *H. rosulata* sp. nov.  
Length of forewing in male 28 mm; male genitalia with costal process shorter than sacculus process .....  
..... *H. mansfieldi* (Prout, 1939)
3. Hindtibia of male without terminal process ..... 4  
Hindtibia of male with terminal process ..... 5
4. Length of forewing in male 25 mm; underside terminal band greyish black ..... *H. perspicillata* sp. nov.  
Length of forewing in male 20 mm; underside terminal band red or red mixed with black .....  
..... *H. cristata cristata* (Warren, 1894)
5. Hindwing base with reddish spot .....  
..... *H. baibarana* (Matsumura, 1931)  
Hindwing base without reddish spot ..... 6
6. Male hindtibia with terminal process less than half length of 1st tarsal joint ..... *H. ochreipicta* (Swinhoe, 1905)  
Male hindtibia with terminal process about half length of 1st tarsal joint ..... 7
7. Wing blue green, outside postmedian line without dark patches; male hindtibia not strongly dilated .....  
..... *H. baba* Swinhoe, 1893  
Wing colour not as above, outside postmedian line with dark patches; male hindtibia strongly dilated ..... 8
8. Forewing with hindmargin bend inwardly, vein 2A expanded and bent in the middle part ..... 9  
Forewing with hindmargin not bend inwardly, vein 2A normal ..... 10
9. Length of forewing in male 19 – 20 mm; costal process short and blunt, processes of transtilla with sharp apex .....  
..... *H. curvata* sp. nov.  
Length of forewing in male 21.5 – 23 mm; costal process slender and long, processes of transtilla with round apex .....  
..... *H. pallensia* sp. nov.
10. Black terminal band on underside broad and extended to outer margin ..... 11  
Black terminal band on underside not extended to outer margin ..... 12

11. Spot on forewing hindmargin, near base black mixed with little reddish brown; hindwing underside with a black brown patch on folder ..... *H. viridaria peperata* (Herbulot, 1989)  
Spot on forewing hindmargin, near base light reddish brown; hindwing underside without black brown patch on folder .....  
..... *H. sinapiaria* (Poujade, 1895)
12. Uncus bifid at apex ..... *H. yazakii* Inoue, 1999  
Uncus rounded at apex ..... *H. supraviridaria* Inoue, 1999

## 1 *Herochroma baba* Swinhoe

*Herochroma baba* Swinhoe, 1893, *Ann. Mag. nat. Hist.*, (6)

12: 148. Syntypes ♂, [India]: Khasi Hills. (BMNH)

*Pseudoterpna baba*: Hampson, 1895, *Fauna Ind. Moths*, 3: 480.

*Actenochroma baba*: Swinhoe, 1900, *Lep. Het. Oxford Mus.*, 2: 386.

**Material examined** China: Hubei: Hefeng, 1 240 m, 2 ♂, 29. VII. 1989, coll. LI Wei. Hunan: Sangzhi, 1 ♀, 20. VI. 1981. Hunan: Tianpingshan, 1 ♀, 20. V. 1981. Guangxi: Longzhou: Nonggang, 330 m, 1 ♂, 15. VI. 2000, coll. YAO Jian. Guangxi: Napo: Defu, 1 350 m, 1 ♂, 18. VI. 2000, coll. LI Wen-Zhu. Ibidem, 1 ♂, 19. VI. 2000, coll. YAO Jian. Guangdong: Lianping, 1 ♀, 19. V. 1922, coll. H. Höne (ZFMK).

**Distribution** China: Hubei, Hunan, Guangdong, Guangxi; N. E. India, Nepal, N. Vietnam, Peninsular Malaysia.

## 2 *Herochroma baibarana* (Matsumura)

*Dindica baibarana* Matsumura, 1931, 6000 illust. Insects Japan-Empire: 893, figured. Holotype ♂, China: Taiwan: Nantou Hsien, Puli. (HUS)

*Archaeobalbis cristata*: Holloway, 1976, *Moth. Borneo*: 59, fig. 395, nec Warren, 1894.

*Archaeobalbis orientalis* Holloway, 1982, in Barlow, *Moth. South East Asia*: 242.

*Archaeobalbis baibarana*: Inoue, 1986, *Bull. Fac. domest. Sci. Otsu Univ.*, 22: 212, figs 1, 2.

*Herochroma orientalis*: Holloway, 1996, *Malay. Nat. J.*, 49 (3/4): 199, fig. 114, pl. 5: 2.

No specimens examined.

**Distribution** China: Taiwan; NE India, Sri Lanka, Malaysia, Indonesia.

## 3 *Herochroma curvata* Han and Xue, sp. nov.

(Figs 1, 2, 11)

*Archaeobalbis subtepens*: Han and Xue, 2002, in: Huang F S (ed.), *Forest Insects of Hainan*: 547. (nec Walker, 1860)

**Male** Lower half of frons dull green, upper half black. Palpus with ochreous, about 1/4 pointed out of frons. Pectus slightly ochreous. Vertex dull green. Hindtibia dilated, with terminal process and two pairs of spurs. Terminal process a little more than half length of 1st tarsal joint.

Length of forewing: 19 – 20 mm. Upperside of wings dull green with dark green. Both wings with small black discal spots. Outer margin of forewing shallowly crenulate, that of hindwing with shallow teeth. Forewing with hindmargin bent, 2A expanded and strongly bent; postmedian line serrated with light line and rufous or dark brown distal shade; light subterminal line indistinct; terminal line a series of small black dots. Hindwing with postmedian line same as forewing; with small rufous dot on veins from  $M_2$  to 2A; subterminal and terminal line same as forewing. Underside: Both wings with big black discal spots and broad black terminal band; the band not extending to outer margin on both wings, mixed with ochreous on forewing.

**Male genitalia** (Fig.11) Uncus small, rounded at apex. Socii swollen at middle, the basal half of club-like socii slightly broader than apical half. Gnathos with serrated triangular central process. Transtilla with a pair of triangular plates, apex sharply pointed. Saccus strongly produced, terminal of valva incurved between it and costal process. Aedeagus slender, manica with a slender spine-like process. Male abdomen with a joined setal patch on 3rd abdominal sternite.

**Female** Unknown.

**Diagnosis** This species is very similar to *H. subtepens* (Walker) and *H. baibarana* (Matsumura), the bend on forewing hindmargin and the bent 2A are characteristic for these three species and the following new species *H. pallensia*. Compared with *H. subtepens* (Walker), there is no small central spur in the middle of ventral side of costa in male genitalia. Compared with *H. baibarana* (Matsumura), the uncus is not bifid but rounded, much shorter than in that species, and the costal base more protruded and forming a

weak angle, not rounded as in that species; the processes of transtilla are differently shaped.

Holotype, ♂, Hainan: Jianfengling, 4. VI. 1981, coll. LIU Yuan-Fu. Paratypes: Guangxi: Napo: Defu, 1 350 m, 2 ♂, 19. VI. 2000, coll. LI Wen-Zhu. Guangxi: Fangcheng: Fulong, 500 m, 2 ♂, 25. V. 1999, coll. YUAN De-Cheng. Ibidem, 2 ♂, coll. LIU Da-Jun. Ibidem, 11 ♂, 24. V. 1999, coll. ZHANG Yan-Zhou. Guangxi: Jinxiu: Shengtangshan, 900 m, 1 ♂, 17. V. 1999, coll. LI Wen-Zhu. Hainan: 1 ♂, 14. VII. 1982, coll. LIN You-Dong; Hainan: Jianfengling, 1 ♂, 6. V. 1983, coll. GU Mao-Bin. Ibidem, 1 ♂, 14. IV. 1981, coll. ZHANG Bao-Lin. Hainan: Jianfengling: Tianchi, 1 ♂, 13. IV. 1980, coll. CAI Rong-Quan.

**Distribution** China: Hainan, Guangxi.

**Notes** Many materials from Guangxi are not in good condition, some are discoloured, and the streaks are not very distinct. But the forewing shape, the venation, especially the bent 2A, and genitalia are the same as specimens from Hainan, so we believe they are conspecific.

#### 4 *Herochroma pallensia* Han and Xue, sp. nov. (Figs. 3, 4, 12)

**Male** Lower half of frons dull green (same as colour of wing), upper half blackish brown. Tip of palpus pointed out of frons, underside of palpus greyish white and lateral side greyish green. Vertex and thorax greyish green. Hindtibia dilated, with terminal process a little longer than half length of 1st tarsal joint. Abdomen without dorsal crests.

Length of forewing: 21.5 – 23 mm. Upperside of wings discoloured. Both wings with black discal spots. Forewing: Costa of forewing blackish brown mixed with reddish brown, outer margin shallowly crenulate; ante-median line indistinct; postmedian line straight, dentate; subterminal line pale and indistinct; terminal line a series of black spots between veins; vein 2A bent but not so strongly as former new species; hindmargin bent. Hindwing: Outer margin serrate; postmedian, subterminal and terminal lines similar with forewing. Under-side: Both wings with big black discal spots; broad ter-

minal band black, not extended to outer margin; inside band dull white with little yellow; forewing with outside of band and near costa mixed with dark reddish brown; terminal line same as upperside.

**Male genitalia** (Fig. 12) Uncus a little elongate, with apex shallowly bifid. Socii short and wide, basal half slender than apical half. Gnathos not very developed, with central process rounded. Transtilla with two linguiform basal plates, apex rounded. Valva broad, with distal margin deeply incurved. Costa very long and slender, with triangular costal base process. Sacculus wider than costa. A ridge of minute teeth from tip of costal process downwards to terminal margin of valva, then to tip of sacculus and then back towards to about half length of sacculus along its edge. Aedeagus slender, manica with two spine-like processes. Male abdomen with a joined setal patch on 3rd abdominal sternite.

**Female** Unknown.

**Diagnosis** Male genitalia of this species is close to that of *H. serrativalva* (Holloway), but the depressed apex of uncus is much shallower than that of *H. serrativalva* (Holloway). There is no triangular ampulla on valva as in *H. serrativalva* (Holloway), but there is a triangular costal base process which does not exist in *H. serrativalva* (Holloway).

Holotype, ♂, Guangxi: Longsheng, 13. VI. 1980, coll. WANG Lin-Yao. Paratypes: Guangxi: Longsheng, 1 ♂, 10. VI. 1980, coll. SONG Shi-Mei. Guangxi: Guilin, 1 ♂, 7. VI. 1980, coll. SONG Shi-Mei. Hunan: Mangshan, 1 ♂, 8. VII. 1981. Fujian: Sangang, 1 ♂, 12. VIII. 1980.

**Distribution** China: Hunan, Fujian, Guangxi.

#### 5 *Herochroma viridaria peperata* (Herbulot)

*Archaeobalbis viridaria peperata* Herbulot, 1989, *Lambillionea*, 88 (11–12): 172, figured. Holotype ♂, Peninsular Malaysia: Cameron Highlands, Strawberry Park. (ZSM)

*Archaeobalbis peperata*: Yazaki, 1994, *Tinea*, 14 (Suppl. 1): 5, fig. 332, pl. 66: 6.

**Material examined** China: Fujian: Sangang, 2 ♀, 17. IX. 1980, coll. JIANG Fan. Guangxi: Napo: Defu, 1 350 m, 1 ♂, 19. VI. 2000, coll. LI

Wen-Zhu. Guangxi: Jinxiu: Luoxiang, 200 m, 1 ♂, 15. V. 1999, coll. HAN Hong-Xiang. Guangxi: Jinxiu: Linhai Shanzhuang, 1 000 m, 1 ♂, 2. VII. 2000, coll. LI Wen-Zhu. Guangxi: Fangcheng: Fulong, 500 m, 1 ♂, 25. V. 1999, coll. YUAN De-Cheng. Ibidem, 1 ♂, 24. V. 1999, coll. ZHANG Yan-Zhou. Guangxi: Shangsì: Hongqi Linchang, 300 – 350 m, 1 ♂ 1 ♀, 29. V. 1999, coll. LI Wen-Zhu. Ibidem, 1 ♂, 28. V. 1999, coll. YUAN De-Cheng. Guangxi: Longzhou: Nonggang, 330 m, 1 ♂, 15. VI. 2000, coll. YAO Jian. Guangxi: Damingshan: Tianping, 1 200 m, 1 ♂, 16. VI. 1984. Hainan: Jianfengling: Tianchi, 2 ♂, 12 – 16. IV. 1980, coll. ZHANG Bao-Lin. Ibidem, 1 ♂, 14. IV. 1980, coll. CAI Rong-Quan. Hainan: Jianfengling, 1 ♂, 26. VI. 1981, coll. GU Mao-Bin. Ibidem, 1 ♂, 7. V. 1982, coll. LIN You-Dong. S O. Szechuan [SE Sichuan]: Kr. Nanchuan: Ginfu-Shan, 2 ♂, IX. 1929, coll. Friedrich (ZFMK).

**Distribution** China: Fujian, Hainan, Guangxi, Sichuan; Malaysia, N. Thailand, N. Vietnam, Nepal.

## 6 *Herochroma yazakii* Inoue, New Record to China

*Herochroma yazakii* Inoue, 1999, *Tinea*, 16 (2): 78 – 79. figs 5, 6, 60, 87. Holotype ♂, Nepal: Kathmandu: Godavari. (BMNH)

*Archaeobalbis viridaria*: Yazakii, 1992, *Tinea*, 13 (Suppl. 2): 6, pl. 2: 10.

**Material examined** China: Sichuan: Guanxian: Qingchengshan, 700 – 1 600 m, 1 ♂, 3. VI. 1979, coll. GAO Ping. Ibidem, 1 ♂, 4. VI. 1979, coll. SHANG Jin-Wen. Sichuan: Dukou: Lanmuqiao, 1 ♂, 22. VIII. 1980, coll. ZHANG Bao-Lin. Sichuan: Fengdu: Shiping, 610 m, 1 ♂, 5. X. 1994, coll. SONG Shi-Mei; Sichuan: Wanxian: Wangerbao, 1 200 m, 27. V. 1994, coll. LI Wen-Zhu; Yunnan: Tengchong: Dahaoping, 2 020 m, 1 ♂, 24 – 26. V. 1992, coll. XUE Da-Yong.

**Distribution** China: Sichuan, Yunnan; N. E. India, Nepal, N. Thailand.

## 7 *Herochroma supraviridaria* Inoue

*Herochroma supraviridaria* Inoue, 1999, *Tinea*, 16 (2): 79, figs 7, 8, 61, 88. Holotype ♂, China: Taiwan. (BMNH)

**Material examined** China: Fukien [Fujian]: Kuatun [Guadun], 2 300 m, 1 ♂, paratype, 21. V. 1938, coll. J. Klapperick (ZFMK). Guangxi: Jinxiu: Shengtangshan, 1 900 m, 1 ♂, 17. V. 1999, coll. YUAN De-Cheng. Guangxi: Jinxiu: Huawang Shanzhuang, 900 m, 1 ♂, 20. V. 1999, coll. ZHANG Yan-Zhou.

**Distribution** China: Fujian, Taiwan, Guangxi.

## 8 *Herochroma sinapiaria* (Poujade)

*Hypochroma sinapiaria* Poujade, 1895, *Ann. Soc. Ent. Fr.*, 64: 309, pl. 6: 5. Holotype ♀, China (West): Moupin. (MNHN)

*Pseudoterpna sinapiaria*: Leech, 1897, *Ann. Mag. Nat. Hist.*, (6) 20: 229.

*Archaeobalbis sinapiaria*: Prout, 1912, in Wytzman, *Genera Insectorum*, 129: 25.

*Herochroma sinapiaria*: Inoue, 1999, *Tinea*, 16 (2): 82, figs 10 – 12, 63, 89.

**Material examined** China: Hunan: Tianpingshan, 1 ♂, 21. VIII. 1981. Tibet [Sichuan: Kangding]: Chasseurs de Ta-tisen-lou, 1 ♂, Ete, 1892 (ZFMK).

**Distribution** China: Shaanxi, Hunan, Yunnan, Sichuan, Xizang.

## 9 *Herochroma ochreipicta* (Swinhoe)

*Actenochroma ochreipicta* Swinhoe, 1905, *Ann. Mag. Nat. Hist.*, (7) 15: 16. Syntypes ♂, [India]: Khasi Hills. (BMNH)

*Pseudoterpna ochreipicta*: Hampson, 1907, *Journ. Bombay Nat. Hist. Soc.*, 18: 52.

*Archaeobalbis ochreipicta*: Prout, 1912, in Wytzman, *Genera Insectorum*, 129: 25.

*Actenochroma montana* Bastelberger, 1911, *Intern. Ent. Zeit. Guben.*, 4: 248.

*Neobalbis montana*: Prout, 1912, in Wytzman, *Genera Insectorum*, 129: 26.

*Archaeobalbis ochreipicta montana*: Prout, 1932, in Seitz, *Macrolepid. World*, 12: 45, pl. 5: g.

*Herochroma ochreipicta*: Inoue, 1999, *Tinea*, 16 (2): 86, figs 17, 18, 66, 92.

Figs. 1 - 10 Adults of *Herochroma*

1. *H. curvata* sp. nov. Holotype, ♂; 2. Ditto. (underside); 3. *H. pallensia* sp. nov. Holotype, ♂; 4. Ditto. (underside); 5. *H. perspicillata* sp. nov. Holotype, ♂; 6. Ditto. (underside); 7. *H. mansfieldi* (Prout), ♂; 8. Ditto. (underside); 9. *H. rosulata* sp. nov. Holotype, ♂; 10. Ditto. (underside). (Natural size)





11



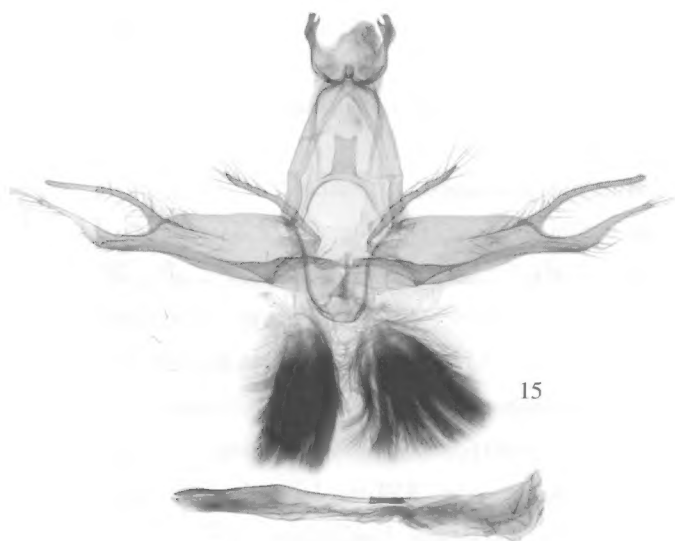
12



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15



16

Figs. 11 – 16 Genitalia

11. *H. curvata* sp. nov. Paratype (IZCAS Geom-00299); 12. *H. pallensia* sp. nov. Paratype (IZCAS GEOM-00321); 13. *H. perspicillata* sp. nov. Holotype (IZCAS Geom-00316); 14. *H. mansfieldi* (Prout) (IZCAS Geom-00308); 15. *H. rosulata* sp. nov. Holotype (IZCAS Geom-00296); 16. Ditto, Paratype (IZCAS Geom-00322)

**Material examined** China: Guangxi: Jinxiu: Luoxiang, 400 m, 1 ♂, 15. V. 1999, coll. LI Wen-Zhu. Fujian: Sangang, 1 ♂, 17. IX. 1980.

**Distribution** China: Fujian, Taiwan, Guangxi, Yunnan; N. E. India, Nepal, N. Vietnam.

**Notes** Compared with Inoue's description, the uncus of materials from Guangxi and Fujian is pointed and the edge of transtilla processes have irregular small teeth. Terminal process on hindtibia quite less than half length of the 1st tarsal joint, not half length as Inoue recorded. Because we didn't find enough differences and didn't have enough material, we identified these two specimens as *H. ochreipicta* (Swinhoe). They might be considered a new species if more material were available.

# **10 *Herochroma perspicillata* Han and Xue, sp. nov.** (Figs. 5, 6, 13)

**Male** Frons greyish yellow brown, with greyish black transverse band. Vertex dull white. Upperside of thorax greyish green. Hindtibia slightly dilated, without terminal process. Colour of abdomen upperside slightly paler than that of wings. Abdomen with distinct dorsal crests on segments 3–4.

Length of forewing: 25.5 mm. Outer margin of forewing slightly crenulate, and that of hindwing serrated. Both wings with black discal spots. Forewing: Antemedian line with two big teeth; postmedian line bend inward under  $Cu_1$ , with small teeth, outside with dull white band; subterminal line serrated, dull white; the area between postmedian and subterminal line with black brown patches. Hindwing: postmedian line almost same as forewing; teeth of subterminal line smaller than that of forewing; terminal line black. Underside: Base of wings white, both wings with big black discal spots; terminal band greyish black, on forewing extended to outer margin, but becoming paler outwards, while on hindwing not extending to outer margin.

**Male genitalia** (Fig. 13) Uncus robust and large, apex flat, middle slightly concave, strongly expanded to two laterals. Socii with apical half much broader than basal half, nearly right angled in the middle. Gnathos

with blunt minute spinulose central process. Transtilla with slender lateral processes, apex round. Valva with swollen costa, apical part membranous, much thinner than base of valva. Middle of sacculus with strongly sclerotized process, apical half wrinkled. Sacculus process rounded. Manica with a short but wide sclerotized process. Male abdomen with a pair of setal patches on 3rd abdominal sternite.

**Female** Unknown.

**Diagnosis** This species is similar to *H. elaearia* (Hampson), but uncus, transtilla structures, and process on sacculus are quite different.

Holotype, ♂ (left forewing missing), Yunnan: Pingbian: Daweishan, 1 500 m, 18. VI. 1956, coll. HUANG Ke-Ren *et al.*

**Distribution** China: Yunnan.

# **11 *Herochroma cristata cristata* (Warren)**

*Actenochroma cristata* Warren, 1894, *Novit. Zool.*, 1: 381.

Syntypes, Bhotan [Bhutan]; [India]: Sikkim; Celebes (South) [Sulawesi]. (BMNH)

*Actenochroma subopalina* Warren, 1894, *Novit. Zool.*, 1: 382.

*Pseudoterpna subtepens* (part.): Hampson, 1895, *Fauna Ind. Moths*, 3: 479, nec Walker, 1860.

*Archaeobalbis subtepens* (part.): Prout, 1912, in Wytzman, *Genera Insectorum*, 129: 25, nec Walker, 1860.

*Archaeobalbis cristata*: Prout, 1930, *Bull. Hill Mus. Witley*, 4: 127.

*Archaeobalbis cristata ab. subopalina*: Prout, 1932, in Seitz, *Macrolepid. World*, 12: 46.

*Herochroma cristata*: Holloway, 1996, *Malay. Nat. J.*, 49 (3/4): 199.

**Material examined** Bhutan, 1 ♂, paratype (ZFMK). China: Kouangsi [Guangxi]: Nanning, 1 ♂, 1929 (ZFMK). Sichuan: Jinyunshan, 1 ♂, 20. IV. 1979, coll. WANG Zi-Qing. Guangxi: Pingxiang, 230 m, 1 ♂, 8. VI. 1976, coll. ZHANG Bao-Lin. Guangxi: Longsheng, 1 ♀, 16. VI. 1980. Ibidem, 1 ♀, 10. VI. 1980, coll. WANG Zi-Qing. Guangxi: Fangcheng: Banbaxiang, 550 m, 1 ♀, 4. VI. 2000, coll. YAO Jian. Hainan: Jianfengling, 1 ♀, 10. I. 1975.

**Distribution** China: Taiwan, Hainan, Guangxi, Sichuan; N. E. India, Bhutan, Nepal, Thailand, N.



Vietnam, Indonesia.

**12 *Herochroma mansfieldi* (Prout) (Figs. 7, 8, 14)**

*Neobalbis mansfieldi* Prout, 1939, *Entomologist*, 72: 208. Holotype ♀, [China]: Yunnan, Teng-Yuek-Ting district. (BMNH)

*Herochroma mansfieldi*: Holloway, 1996, *Malay. Nat. J.*, 49 (3/4): 201.

Size, shape, streaks of male same as in female.

Male and female length of forewing: 29 mm.

**Male genitalia** (Fig. 14) Typical *flavibasalis*-group, very similar to *H. clariscripta* Holloway and *H. flavibasalis* (Warren). Valva with sacculus process shorter than that of the latter two species. Compared with *H. clariscripta* Holloway, valva much broader, transtilla with the central process much longer, about 1/2 length from base of it to the bottom of uncus, but that of *H. clariscripta* Holloway only 1/3. Compared with *H. flavibasalis* (Warren), transtilla with the central process much slender and longer. Aedeagus with a long sclerotized process on manica. Eighth tergite and sternite sclerotized, sternite with a little produced central sclerite. Male abdomen with a pair of setal patches on 3rd abdominal sternite.

**Female genitalia** Papilla analis bifid. Lamella antevaginalis with a pair of large plates, basal 1/4 narrower. Ductus bursae short, strongly sclerotized. seventh sternite strongly sclerotized, lateral wrinkled. Corpus bursae large, without signum.

**Material examined** China: Yunnan: Tong-Yueh-Ting dist. [Tengchong], 1 ♀, holotype (BMNH, slide no. Geom. 18115). Hubei: Zigui: Jiulingtou, 250 m, 1 ♂, 25. VII. 1993, coll. SONG Shi-Mei. Hubei: Xingshan: Longmenhe, 1 350 m, 1 ♀, 22. VII. 1993, coll. SONG Shi-Mei.

**Distribution** China: Hubei, Yunnan.

**Notes** Inoue (1999) described the female genitalia as "Lamella antevaginalis with a spine-like lateral process, ductus bursae short, sclerotized and striped. Corpus bursae very large, thinly and minutely spinulose, signum absent". After examining the slide of the holotype, we found that he had confused part of the sclerotized 7th sternite with the lamella antevaginalis.

The true lamella antevaginalis are the big plates. There are no thinly and minutely spinulose in corpus bursae, but only some debris adhering to the bursae that had not been cleaned up. Inoue (1999) also recorded "Length of forewing: 34 mm" in the female, but that of the holotype female is just 29 mm. Only female holotype is known. After carefully examining the two specimens mentioned above, which come from two not very widely separated locations in Hubei, we think they are conspecific. So this is the first record and description of the male of this species.

**13 *Herochroma rosulata* Han and Xue, sp. nov. (Figs. 9, 10, 15, 16)**

Frons blackish brown. Vertex greyish green. Hindtibia with two pairs of spurs, without terminal process.

Length of forewing: 24 – 25 mm. Upperside of both wings yellowish green. Outer margin of both wings crenulate, anal angle of hindwing not produced. Forewing: postmedian line serrate, subterminal line greenish white and serrate, antemedian line on hind margin and the area outside of postmedian line mixed with red brown and black brown scales; discal spots dark green, nearly oblong. Hindwing: postmedian line indistinct, crenulate, outside with red brown and black brown scales; subterminal line indistinct; terminal line a series of small dark yellowish green dots; fringe greenish white. Underside: basal area yellow, forewing with a large oblong black discal spot, that on hindwing very slender, dash-like; terminal band weakly expanded, leaving white terminal area; inner edge of the band on forewing bend upon Cu<sub>1</sub>, but that on hindwing much straighter.

**Male genitalia** (Fig. 15) Uncus reduced. Socii developed and bifid, ventral one tapering. Transtilla with an oblong process, apex depressed, with sparse spines, length about two times width. Valva very narrow, with long and slender basal process; costal and sacculus processes slender; costal process as long as the length of sacculus process, with the apex rounded; base of sacculus process expanded. Manica with a long sclerotized process. Male abdomen with a pair of setal

patches on 3rd abdominal sternite. Eighth sternite sclerotized, with a little produced central sclerite.

**Female genitalia** (Fig. 16) Papilla analis bifid. Lamella antevaginalis with a pair of large oblong plates. Ductus bursae much shorter than corpus bursae, sclerotized. Shape of corpus bursae very similar to that of *H. mansfieldi* (Prout). Signum absent. seventh abdominal sternite strongly sclerotized.

**Diagnosis** This species is very similar to *H. mansfieldi* (Prout), but is much smaller, inner edge of terminal band on hindwing underside much straighter than that of *H. mansfieldi* (Prout). The costal and sacculus processes in male genitalia are in equal length, but in *H. mansfieldi* (Prout) and other *flavibasalis*-group species, costal process is distinctly shorter than sacculus process.

Holotype, ♂, Hainan: Jianfengling, 28. IX. 1983, coll. LIU Yuan-Fu. Paratypes: Hainan: 1 ♀, 28. IX. 1983, coll. LIU Yuan-Fu. Ibidem, 1 ♂, 23. XI. 1983, coll. LIU Yuan-Fu.

**Distribution** China: Hainan.

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# 中国始青尺蛾属研究及四新种记述

(鳞翅目：尺蛾科：尺蛾亚科)

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**摘要：**始青尺蛾属 *Herochroma* Swinhoe, 1893 为东洋界分布，世界共记录 30 种。本文综述了所有中国有记载的种类，其中记述 4 个新种：弯脉始青尺蛾 *H. curvata* sp. nov., 淡色始青尺蛾 *H. pallensia* sp. nov., 宏始青尺蛾 *H. perspicillata* sp. nov., 玫始青尺蛾 *H. rosulata* sp. nov.; *H. yazakii* Inoue 为中国（四川、云南）新记录种；并首次记载 *H. mansfieldi* (Prout) 的雄性。编制了中国种类检索表，附新种的成虫及外生殖器图。新种的模式标本保存在中国科学院动物研究所。

**关键词：**鳞翅目；尺蛾科；始青尺蛾属；新种；中国

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